**Name: Maryam Azhar**

**Sap ID: 43755**

**Program: BSCS**

**Semester: 6th**

LAB 2

**Task 1:** Write down the advantages and disadvantages of RJ45 connectors.

**Answer:**

|  |  |
| --- | --- |
| **Advantages** | **Disadvantages** |
| **Ease of Use**: The connectors are straightforward to connect, making them user-friendly | **Limited Range**: RJ45 connectors and Ethernet cables have a range limit, typically around 100 meters (328 feet) for standard Ethernet. |
| **Cost-Effective**: RJ45 connectors are relatively inexpensive compared to other networking solutions, such as fiber optics. | **Physical Size**: RJ45 connectors are relatively large compared to some other types of connector, which can be a drawback in tight spaces or for portable devices. |
| **High-Speed Data Transmission**: RJ45 connectors support high-speed data transmission. | **Cable Bulk**: Ethernet cables with RJ45 connectors can be bulky and less flexible, which may be inconvenient in environments requiring tight cable management. |
| **Reliability**: RJ45 connections are generally reliable and provide stable network connections when properly installed. | **Less Secure**: RJ45 connectors are not as secure as some other types of connectors (e.g., fiber optics) and can be more easily damaged. |
|  |  |

**Task 2:** Briefly explain how the data is transmitted in wireless medium.

**Answer:** In wireless data transmission, data is encoded into electromagnetic waves. These waves travel through the air to a receiver. A receiver then captures the electromagnetic waves with its antenna. It converts these waves back into electrical signals. The receiver decodes the electrical signals into the original data format. The process allows for communication without physical cables.

**Task 3:** Briefly explain all types of network topologies.

**Answer:**

**Bus Topology**: Devices connect to a single central cable. Simple but prone to failure if the central cable fails. It is less reliable and less costly.

**Star Topology**: Devices connect to a central hub. It is Reliable depends on the hub. It is comparatively less costly.

**Ring Topology**: Devices form a closed loop, with data traveling in one direction around the ring.

**Mesh Topology**: Each device connects directly to every other device. It is highly reliable.

**Tree Topology**: A hybrid of star and bus topologies, where groups of star-configured devices connect to a central bus. It can be complex.